SS 814 MATHEMATICAL PHYSICS 4 0 0 4

Review of Analysis, Complex variables, vector calculus, generalized functions, infinite series, Fourier series and transforms.

Partial differential equations of Mathematical physics: Physical background of: Laplace, Poisson, wave and Klein Gordon equations

Methods of solving differential equations: Classification of Partial differential equations and Boundary conditions. The Cauchy problems. Separation of variables in Cartesian, spherical and Cylindrical coordinates. Ordinary and singular points. Ordinary differential equations and their series solutions. Ordinary and singular points. Regular and irregular singular points. Wronskian of second order differential equations. Expansion about a singular point.

Special Functions: Gamma function, Legendre polynomials. Recurrence relations and orthogonal properties of the falling special functions. Neumann functions. Bessel functions of imaginary argument. Hyper geometric functions.

Linear integral equations: Types of integral equations. Integral equation with separable kernels, Solution of integral equation of second kind by successive substitutions. Fredholm's method of solution of the inhomogeneous equation and the homogeneous equation

TEXT BOOKS / REFERENCES:

1. A K Ghatak, I C Gayal, S J Chua, *"Mathematical Physics",* McMillan India Limited, 1995. 2. R Courant and D Hilbert*, Methods of Mathematical Physics,* Wiley Eastern, 1953